

Appl. No. 10/750,178
Amdt. Dated April 20, 2007
In Response to Office Action of October 23, 2006

REMARKS

Claims 1-13, 22-25, 49-51, and 58 are currently pending in the Application, of which claims 1 and 49 are the only pending independent claims.

Of the pending claims, all stand rejected: claims 49-51 and 58 remain rejected as anticipated by Armistead (5,838,759), while

- claims 1-3, 6-8, and 13 stand rejected as unpatentable over Gozani and Swift;
- claims 1 and 22-24 stand rejected as unpatentable over Armistead in view of Swift;
- claims 9-11 and 25 stand rejected as unpatentable over Gozani and Swift and further in view of Annis;
- claim 12 stands reject as unpatentable over Gozani in view of Swift, Annis, and Resnick.

IDS

The Office Action refers to an Information Disclosure Statement filed January 11, 2005.

Applicants have filed two Information Disclosure Statements in the present case, one dated February 9, 2004 (“Applicants’ IDS of 2-9-04”) and one dated August 3, 2006 (“Applicants’ Supplemental IDS of 8-3-06”).

Applicants’ IDS of 2-9-04 appears on PAIR bearing a Transaction Date of January 11, 2004 (!) but showing a stamped receipt date by the Office of Initial Patent Examination of February 11, 2004.

Applicants’ IDS of 2-9-04 is believed to comply with the provisions of 37 CFR 1.98, however, Applicants’ IDS of 2-9-04 appears not to have been considered. Indeed, the Form 1449 attached to the Office Action of February 3, 2006 is not Applicants’ at all, but refers to an applicant named Tanaka, and bears a handwritten Application Serial No, 10/772,842, though that number is crossed out.

Therefore, to ameliorate confusion in the file, Applicants append a duplicate

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copy of Applicants' IDS of 2-9-04 and request consideration of the references submitted therein, to the extent that they are found to be in compliance with all provisions of 37 CFR 1.98:

While copies of foreign patents and publications are not believed to be required, in accordance with 37 CFR 1.98 (d) (1), Applicants provide them as a courtesy to the Examiner, so that their substance may be considered. To the extent that bibliographic data are not available and were thus not disclosed, Examiner is free to disregard those references, and they are not deemed germane to the subject matter of the pending claims. Reference BE, and references BF and BG, disclosed in Applicants' Supplementary IDS of 8-3-06, may be disregarded.

The claims (49-51 and 58) rejected for anticipation

Independent method claim 49 has been amended to clarify that the x-ray image produced in accordance with the claim is based on penetrating radiation used to illuminate the object (claimed step (a)) and scattered by the object (claimed step (c)), as described in the Application on page 7, from line 17 through the end of the page. The amended language distinguishes Armistead in that there is no teaching in Armistead whatsoever that backscattered penetrating radiation be used for imaging. Indeed, as has been discussed at length on the record, backscatter is mentioned in Armistead only in the context of shielding against its detection, and, according to Armistead, it is either not detected, or else it is temporally gated out of the signal, such that the signal reflects only the detection of resonant gammas rays due to neutron activation of specified atoms. Backscatter is certainly not used for imaging.¹

¹ The Examiner's observation that shielding of radiation obeys an exponential attenuation law (and therefore cannot reduce backscatter intensity to zero), while not traversed, is non-availing, since, in accordance with the teachings of Armistead, sufficient shielding is to be provided so that backscatter does not comprise part of the *detected* signal. If the flux of backscattered radiation is attenuated to a level of detector noise, then no backscatter can be detected. The flux of sunlight passing through the Earth onto its dark side (i.e., coming up from the ground at night) may, by the Examiner's argument on page 13, be non-zero, however, none has ever been detected.

Therefore, claim 49 and its dependent claims, 50, 51 and 58, are drawn to methods that are neither taught nor suggested by Armistead.

Obviousness in view of Swift taken to stand for backscatter imaging

The pending rejection of the other pending claims (notably claim 1, the sole independent device claim) relies on combinations of various references with Swift, where Swift is taken to stand for the use of backscatter imaging (taught by Swift), and where the combination of Swift with anything else is purportedly “suggested” by three advantages of backscatter imaging taught by Swift.

Applicants acknowledge that backscatter is a useful imaging modality, for the reasons taught by Swift, and in the present Application. However, its universal combination with any other technology is not always desirable, nor is it obvious. In particular, no *prima facie* case of obviousness has been made out with respect to combination of Swift’s backscatter imaging with either Gozani or Armistead.

1. Gozani is unsuited to combination with backscatter imaging absent the teaching of the present invention.

Gozani teaches irradiating an object with fast neutrons that excite characteristic gamma-ray fluorescence lines, which are, in turn, detected and analyzed.

The invention claimed in claim 1 of the present Application is not the overlay of neutron-activated gamma-ray fluorescence spectroscopy (the technology taught by Gozani) with x-ray backscatter imaging (Swift) that would result from the combination of references invoked in the Office Action, nor is it suggested by such an overlay.

In particular, use of a single detector to detect scattered particles from the illuminating beam and other particles that arise spontaneously from within the interrogated object is nowhere taught or suggested by Gozani, alone or in combination with Swift. That is a teaching of the present invention.

Even if the Gozani detectors were to be used to detect backscatter of the

illuminating x-ray radiation (a supposition made with *no* suggestion, and without any reason to believe, that the Gozani gamma-ray detectors would be suited to detect x-ray backscatter), there would need to be some means by which to discriminate the neutron-induced gamma rays of Gozani from the x-ray backscatter of Swift in order for the Gozani and Swift mechanisms to both work. With the possible exception of the present invention, there is no teaching as to how such discrimination could be achieved.

Moreover, the claimed invention requires

a detector signal triggered, at least in part, by an origin other than the illuminating penetrating radiation,

whereas the photons detected both by Gozani and by Swift *are* triggered by the illuminating penetrating radiation.

Moreover, the neutron detector of Gozani does not detect neutrons arising indigenously in the inspected material but rather simply monitors transmission through the object of illuminating fast neutrons to derive nuclear density, again, merely another imaging modality.

Moreover, the present invention does not claim merely gated illumination and detection (as introduced in the additional limitation of claim 9), but teaches detection during the “off” period of the source, thereby giving rise to the requirement, in claim 1, of a processor configured as a detector signal discriminator, a feature neither taught nor suggested by any combination of references.

Therefore, claim 1 is allowable over Gozani and Swift taken together, as are all the claims depending from claim 1, namely claims 2-13, and 22-25.

2. *Armistead is unsuited to combination with backscatter imaging absent the teaching of the present invention.*

A processor configured as a detector signal discriminator between scattered incident radiation and radiation of an indigenous origin (as required by element (c) of claim 1) cannot be suggested by any combination of Armistead with Swift because Armistead teaches the troubling nature of the “x-ray flash” – that the gamma-ray resonance line analysis technique is subverted by backscatter, against which the

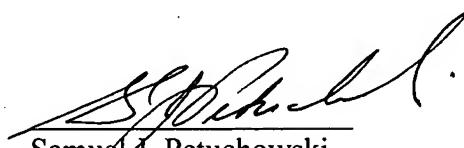
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While the present invention teaches that the use of the self-same detectors for both indigenous radiation (spontaneous decay) and backscattered illuminating penetrating radiation may provide enumerated advantages, the Armistead patent is unwilling to allow that backscatter might be useful for any purpose.

Since Armistead teaches away from the detection of backscattered radiation and denies any utility to be derived therefrom, Armstrong cannot be combined with any reference that teaches its use for imaging. Therefore, claim 1, and all pending claims dependent therefrom, are deemed to be patentable over Armistead, taken alone or in combination with Swift.

Reconsideration of the pending claims in light of the foregoing discussion, and their allowance, are now respectfully requested.

Respectfully submitted,



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